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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,908	12/16/2003	Seung-Do Han	P24708	3880

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EXAMINER	
NGUYEN, TRAN N	
ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 07/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/735,908	HAN ET AL.	
	Examiner	Art Unit	
	Tran N. Nguyen	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 10-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 10-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2 pgs.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 1 and 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over *each individual one* of the refs:

Ivanics (US 4,745,318) or **Klode (US 6703740)** or **DE 19548117** or **Saka Masiki (JP 04-325860)** in view of **Itaya (US 5,500,994)** or as alternately in view of **Imai et al (JP- 53-138005)**.

Ivanics (figs 1-4) or **Klode** (figs 2-3) or **DE 19548117** (figs 2-3, 10) or **Saka Masiki** (fig 1) discloses an induction motor comprising:

a stator installed at an inner circumferential surface of a motor body, wherein the stator on which a plurality of coils are wound;

a rotor rotatably installed at a center portion of the stator and provided with a rotation shaft (30) at a center thereof, and

a ring magnet unit freely and rotatably installed between the stator and the rotor with a first air gap from the stator and a second air gap from the rotor.

Regarding the support, Klode's fig 2 discloses the magnet is coupled to a supporter (38, fig 2), or **DE 19548117** discloses the magnet is coupled to the supporter part (at 4a, 4c, 4f in figs 2-3) or **Saka Masiki** discloses the magnet is coupled to the supporter (30a-30b fig 1).

Regarding the yoke, as in claim 1, **DE 19548117**, however, teaches a rotary magnet unit having a back yoke (112), and the magnets (113) attached to an outer circumferential surface of the back yoke (112) (Fig10). The back yoke serving two purposes: (1) provide mechanical support for the magnet for increasing structural integrity, and (2) acting as magnetic return means for the magnet to enhance the magnetic characteristics of the magnet unit related to the rotor and the stator. Furthermore, magnet unit having backyoke for mechanical and magnetical supports is well known in the art.

Each of the refs substantially discloses the claimed invention, except for the newly added limitations that the supporter is integrally injection-molded at one side of the magnet unit.

Itaya, however, teaches a rotor having supporter (31) being integrally injected molded at one side of the magnet (32) (fig 1, 4-5). Alternately, **Imai** eaches a rotor having supporter (10) being integrally injected molded at one side of the magnet (figs 1-2) for the purpose of reducing assembling part and cost of machining as well as enhance the magnet mechanical support.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by provide the magnet unit is coupled to a supporter that is integrally injection-molded at one side of the magnet unit, as taugt by either Itaya or Imai. Doing so would enhance mechanical support for the magnet unit, also reduce assembling part and cost of machining.

3. **Claims 10-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over one of the combinations of refs listed in the rejection against the base claims, and further in view of **Elliott et al (US 4,694,210).**

Particularly the Ivanics' magnet unit is a cylindrical ring magnet (6) located between the stator (2) and the rotor (4),

a supporter (7) of non-magnetic substance is coupled to both ends of the ring magnet, for supporting the ring magnet, and

a bearing (8, 12), particularly needle bearing, which is an oil-less bearing, is fitted into a center of the supporter (7) so as to be rotatably coupled to an outer circumferential surface of the rotation shaft.

Ivanics' Figs 1 and 3-4 show the bearing (8, 12) fitted into the center of the support without any additional fastening component to secure the bearing therebetween. *Therefore, Ivanics does not clear disclose that the bearing is press-fit fitted into a center of the supporter so as to be rotatably coupled to an outer circumferential surface of the rotation shaft.*

Elliot, however, teaches a support structure having bearing (104, 106) press-fit into the supporter and snugly secured within the supporter to abut outer circumferential surface of the rotation shaft. Bearings press-fit between two components for supporting rotation are well known in the art. Those skilled in the art would realize that by press-fitting the bearing therebetween the supporter and the shaft, one can provide a mechanical orientation of the rotor and the shaft, as well as the bearing for an easy to assemble motor design with a minimal number of part counts and eliminate additional fastening means to abut the bearing therebetween the two structure.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by provide the bearing as press-fit bearing, as taught by Elliot. Doing so would provide a mechanical abutment among the supporter, the shaft and the bearing for an easy to assemble motor design with a minimal number of part counts and eliminate additional fastening means to abut the bearing therebetween the two structure.

Regarding claim 12 recites the backyoke is nonmagnetic, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select nonmagnetic material for the backyoke in order to provide mechanical support for the magnet only while obtaining less-weight and less-cost for the magnet unit. I it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin, 125 USPQ 416.*

4. **Claims 10-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over one of the combinations of refs listed in the rejection against the base claims, and further in view of **Shiga et al** et al (**US 6, 093,984**).

The combinations of the above prior art refs substantially discloses the claimed invention, except for the added limitations of the above listed claims.

Regarding claims 10-11, and 13, **Shiga**, however, teaches a rotor magnet unit (figs 1-2) comprising:
a soft magnetic back yoke (36) in the rotor;
a plurality of permanent magnets (38) attached to an circumferential surface of the back yoke (36);
a supporter (29) is integrally injection-molded at one side of the ring magnet in order to couple to one end of the back yoke (7) so as to support the back yoke.

Shiga teaches that the rotor magnet unit structure would be more reliable, and a simple and economical connection between the permanent magnet ring and the plastic support element without the magnet cracking; and that a long service life and good startup properties are guaranteed. In addition, a further object of the invention is also to guarantee that the mounting of the rotor is easy to produce and that it enables easy installation of the rotor into the housing of the electric motor and guarantees quieter operation.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring the rotor with molded supporter, a magnetic back yoke, and plural magnets formed into a cylindrical ring, wherein the supporter is integrally molded to one end of the magnet ring, as taught by Shiga. Doing so would provide the motor with a rotor that would be more reliable and quieter operation.

Regarding the supporter is integrally injection-molded at both sides of the ring magnet, as in claim 14, **Ivanics** discloses that the magnet ring is supported at both sides thereof by supporter (7). Shiga teaches that the supporter can be integrally injection-molded to the magnet ring for ensuring firmly mechanical support and structurally reliable.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring both end-side supporters as integrally injection-molded structure with the magnet, as taught by Shiga. Doing so would ensuring firmly mechanical support and structurally reliable of the magnet unit.

Regarding the back yoke is set as 0.2-0.6 mm, as in claim 15, Shiga teaches a back yoke but silence about the thickness thereof. Those skilled in the art would understand that in order to ensure that the back yoke sufficiently provide both mechanically and magnetically supports the magnet ring, the width size of the back yoke is selected based upon the size of the magnet ring. Doing so would be a matter of obvious engineering design that requires only necessary skills. Evidently, as the claimed language points out, it is preferably set to be in the recited range.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring the back yoke having the thickness as in the recited range of 0.2-0.6 mm. Doing so would ensure that the back yoke would sufficiently both mechanically and magnetically support the magnet ring. Furthermore, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller, 105 USPQ 233*).

5. **Claims 16-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over one of the combinations of refs listed in the rejection against the base claims, and further in view of **Bernreuther** et al **(US PgPub 2003/0,168,925)**.

The combination of refs substantially discloses the claimed invention, except for the added limitations of the above listed claims.

Regarding claims 16-17, 19, and 20-21, for the purpose of providing a rotor that is noise reduced, reliable increased, and construction simplified without the magnet cracking, **Bernreuther,** teaches a rotor structure (fig 1a, 1c-d, and 2) with magnet unit (5) having molded supporter (8) incorporated support the magnet of the rotor by molding (22); wherein molded supporter (8) is integrally injection-molded at both side of the ring magnet. Also, as shown in figs 1b and 2, the rotor has a single cylindrical magnet having a curvature arranged in the molding towards a circumference direction.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring the magnet unit with integrally injection-molded supporter at both side of the ring magnet incorporated support the magnet of the rotor by molding, as taught by **Bernreuther.** Doing so would provide the rotor with a magnet unit that would be more reliable, quieter, and simpler.

Regarding claim 18, while Ivanics discloses the supporters are at both sides of the magnet ring, those skilled in the art would realize that this is a matter of determine the level of support that the magnet ring requires. For example, Shiga, as discussed in previous section, shows the supporter as an injection-molded structure at one side of the molding still sufficiently provide support for the magnet ring. This is a matter of obvious engineering design choice to provide one side support or both sides support for the magnet ring based upon the size and weight of the magnet ring. As for one side support, this would reduce the overall size of the magnet unit and simplify the manufacturing process.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring the supporter as an injection-molded structure at one side of the molding. Doing so would reduce the overall size of the magnet unit and simplify the manufacturing process while equivalently provide the mechanical support for the magnet ring.

6. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over one of the combinations of refs listed, in view of **Kumakura (USP 4227105).**

The combinations of ref substantially discloses the claimed invention, particularly **DE 19548117** discloses the magnet is coupled to the supporter part, wherein the supporter's part 4a, 4c, 4f (as shown in in figs 2-3) surrounding the magnets, but **DE 19548117** does not discloses that the supporter is a injected molded so that magnet unit having molded resin pockets covers over the entire area of each magnet.

Kamakura, however, teaches a rotary magnet unit having a molding (41), and the magnets (29) formed inside the moding (41), wherein the molding (41) completely surrouding each magnet. The molding serves the purpose of providing mechanical support for the magnet for increasing structural integrity.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by provide the magnet unit with a molding surrounding thereof , as taught by **Kamakura.** Doing so would provide mechanical means to support the magnets during the magnet unit in rotation.

7. **Claims 24-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over one of the combinations of refs listed in the rejection against the base claims, and in view of **Bernreuther** et al **(US PgPub 2003/0,168,925)**.

The combination of refs discloses the claimed invention, except for the added limitations of the above listed claims.

Regarding the molding supporter, for the purpose of providing a rotor that is noise reduced, reliable increased, and construction simplified without the magnet cracking, **Bernreuther,** teaches a rotor structure (fig 1a, 1c-d, and 2) with magnet unit (5) having molded supporter (8) incorporated support the magnet of the rotor by molding (22); wherein molded supporter (8) is integrally injection-molded at both side of the ring magnet. Also, as shown in figs 1b and 2, the rotor has a single cylindrical magnet having a curvature arranged in the molding towards a circumference direction.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring the magnet unit with integrally injection-molded supporter at both side of the ring magnet incorporated support the magnet of the rotor by molding, as taught by **Bernreuther.** Doing so would provide the rotor with a magnet unit that would be more reliable, quieter, and simpler.

Also, while The combination of refs discloses the supporters are at both sides of the magnet ring, those skilled in the art would realize that this is a matter of determine the level of support that the magnet ring requires. For example, Shiga, as discussed in previous section, shows the supporter as an injection-molded structure at one side of the molding still sufficiently provide support for the magnet ring. This is a matter of obvious engineering design choice to provide one side support or both sides support for the magnet ring based upon the size and weight of the magnet ring. As for one side support, this would reduce the overall size of the magnet unit and simplify the manufacturing process.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the motor by configuring the supporter as an injection-molded structure at one side of the molding. Doing so would reduce the overall size of the magnet unit and simplify the manufacturing process while equivalently provide the mechanical support for the magnet ring.

Regarding the bearing is either ball bearing type or oilless bearing type, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select either ball bearing or oilless bearing types based upon the size of the magnetic unit as well as the rotor units so that the bearing would sufficiently provide rotatably support for the magnetic unit. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin, 125 USPQ 416.*

Regarding the supporter is forme by either nonmagnetic material or same material as the ring magnet, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select either non-magnetic material or magnetic material that is same as the magnet ring. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin, 125 USPQ 416.*

Regarding the ring magnet is a single ring element instead of plural sections combined into a cylindrical ring, as disclosed by the prior art, it would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the magnet ring as a single magnet element because this would enhance the strength of the magnet to withstand the centrifugal force during the magnet unit in rotation. Also, a change in size or shape is generally recognized as being within the level of ordinary skill in the art. *In re Rose,* 105 USPQ 237 (CCPA 1955) (emphasis added). Furthermore, a single magnet ring having a cylindral shape is well known in the art.

Conclusion

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tran N. Nguyen whose telephone number is (571) 272-2030. The examiner can normally be reached on M-F 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571)-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tran N. Nguyen
Primary Examiner
Art Unit 2834